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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,958	03/23/2004	Jenoe Tihanyi	I434.105.101/IFT976US	2360

7590 08/18/2005

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EXAMINER

PHAM, LONG

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 08/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

18

Office Action Summary	Application No.	Applicant(s)	
	10/806,958	TIHANYI, JENOE	
	Examiner	Art Unit	
	Long Pham	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03/20/04 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>11/22/04</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

1. Applicant's election without traverse of claims 1-20 in the reply filed on 06/22/05 is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-7, 12, 13, 14, 15, 16, 17, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Yasuhara et al. (EP 1073123).

With respect to claims 1 and 13, Yasuhara et al. teach a semiconductor component comprising (see figs. 1-20 and associated text):

a semiconductor body with a first semiconductor layer 1 of a first conduction type p and a second semiconductor layer 6 of a second conduction type n, which is applied on the first semiconductor layer and forms a front side of the semiconductor body;

in the second semiconductor layer, a first terminal zone 3 of the second conduction type n, a drift zone 6 of the second conduction type n, a channel zone 2 of the first conduction type p, which is formed between the first terminal zone and the drift zone, and a second terminal zone 5 of the second conduction type n, which is arranged at a distance from the channel zone in a lateral direction of the semiconductor body;

a first drive electrode 10 arranged in a manner insulated from the front of semiconductor body and adjacent to the channel zone; and

at least one second drive electrode 14, which, proceeding from the front side, extends through the second semiconductor layer right to the first

semiconductor layer and which is insulated from the semiconductor from the semiconductor body.

With respect to claims 2 and 14, Yasuhara et al. further teach a plurality of second drive electrodes 14 arranged at a distance from one another. See fig. 4.

With respect to claims 3 and 15, Yasuhara et al. further teach the plurality of the second drive electrodes are formed in pillar-type fashion. See fig. 4.

With respect to claims 4 and 16, Yasuhara et al. further teach the plurality of second drive electrodes are completely surrounded by an insulation layer 13 in the semiconductor body. See fig. 4.

With respect to claims 5 and 17, Yasuhara et al. further teach the plurality of second drive electrodes are connected to a defined potential. See figs. 4 and 5.

With respect to claims 6 and 18, Yasuhara et al. further teach the plurality of second drive electrodes and the first terminal zone are connected to the same potential. See figs. 4 and 5.

With respect to claim 7, Yasuhara et al. further teach the first drive electrode is arranged above the front side of the semiconductor body. See fig. 5.

With respect to claim 12, Yasuhara et al. further teach the at least one second drive electrodes is arranged nearer to the channel zone than the second terminal zone.

With respect to claim 13, Yasuhara et al. further teach that the first terminal zone in the second layer, the drift zone in the second layer, the second terminal zone and channel zone are separated by a distance on the front side of the semiconductor body, and the first drive electrode is insulated from the semiconductor body and adjacent to the channel zone.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter ^opertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 8, 9, 10, 11, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuhara et al. (EP 1073123) as applied to claims 1-7, 12, 13, 14, 15, 16, 17, and 18 above, and further in view of Gajda et al. (US publication 2003/0042556).

With respect to claims 8 and 19, Yasuhara et al teach forming the gate electrode on the semiconductor body but fail to teach forming the gate electrode in the semiconductor body.

However, the formation of a trenched gate electrode is well-known in the art.

With respect to claims 9 and 20, Yasuhara et al. fail to teach that the first semiconductor layer is more heavily doped at one side than the other or concentration distribution.

However, it would have been obvious to one of ordinary skill in the art of making semiconductor devices to determine the workable or optimal concentration distribution for concentration of the first semiconductor layer through routine experimentation and optimization to obtain optimal or desired device performance because the concentration distribution is a result-effective variable and there is no evidence indicating that that is critical or produces any unexpected results and it has been held that it is not inventive to discover the optimum or workable ranges

Art Unit: 2814

of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

With respect to claims 10 and 11, Yasuhara et al. fail to teach forming a semiconductor region or zone in the drift zone adjacent to the trenched gate and in upper surface of the semiconductor body.

Gajda et al. teach forming a doped region or guard-ring region 15 around a buried gate in the upper surface of a semiconductor body to allow the advantageous optimization of channel. See [0006].

it would have been obvious to one of ordinary skill in the art of making semiconductor devices to incorporate the above teaching of Gajda et al. into the device of Yasuhara et al. to attain the above benefit.

Conclusion

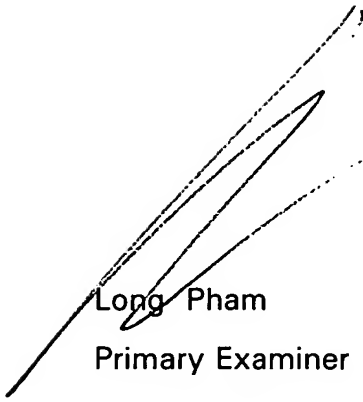
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long Pham whose telephone number is 571-272-1714. The examiner can normally be reached on M-F, 7:30AM-3:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/806,958
Art Unit: 2814

Page 6



Long Pham
Primary Examiner
Art Unit 2814

LP